

Lead and Copper Rule Sampling Guidance

For Small Water Systems (serving 3,300 persons or fewer)

Prepared by: Division of Drinking Water
Southern California Drinking Water Field Operations Branch
Visalia District
265 W. Bullard Avenue, Suite 101
Fresno, CA 93704
Phone: (559) 447-3300

This guidance document was developed to help small water systems comply with the California Lead and Copper Rule. The Lead and Copper Rule requires community and nontransient-noncommunity water systems to monitor lead and copper levels at the consumers' taps. If action levels are exceeded, installation of corrosion control treatment is required. If the action level for lead is exceeded, public notification is required.

Lead Action Level = 0.015 mg/L (or 15 µg/L)
Copper Action Level = 1.3 mg/L (or 1300 µg/L)

Compliance with the lead and copper action levels is based on the 90th percentile lead and copper levels. This means that the concentration of lead and copper must be less than or equal to the action level in at least 90% of the samples collected.

To help explain how to comply with the California Lead and Copper Rule, information on the following topics is included in this document:

- Section 1 - Number of Tap Sample Sites Required
- Section 2 - When to Sample
- Section 3 - Where to Sample
- Section 4 - How to Sample
- Section 5 - How to Calculate the 90th Percentile Lead and Copper Levels
- Section 6 - What to Do if You Exceed the Lead or Copper Action Level
- Section 7 - How to Report Your Sample Results
- Section 8 - Monitoring Waivers

Attachments to this document include:

1. "Lead and Copper Results Worksheet"
2. Form 141-AR "Lead and Copper Rule Sampling Report"

Section 1. Number of Tap Sample Sites Required

The number of tap sample sites required is shown in Table 1, and is based on the population served by your water system and if you are performing Standard or Reduced Monitoring.

Table 1. Minimum Number of Tap Sample Sites Required

System Population	Minimum Number of Tap Sample Sites	
	Standard Monitoring	Reduced Monitoring
501 to 3,300	20	10
101 to 500	10	5
Less than 101	5	5

Section 2. When to Sample

- **Standard Monitoring:**

Each water system must complete at least two consecutive 6-month Standard Monitoring periods with no exceedance of the lead or copper action level before the frequency of sampling can be reduced. During each 6-month Standard Monitoring period, you must collect at least one tap sample from the number of sites shown in Table 1 under Standard Monitoring.

Therefore, during your first year of sampling, collect a set of samples in the first six months and a set of samples in the second six months. Samples must be analyzed for both lead and copper.

If at any time your 90th percentile lead or copper level exceeds the action level, you must contact this office for further guidance.

- **Reduced Monitoring:**

If you have completed two consecutive 6-month Standard Monitoring periods and the 90th percentile levels do not exceed 0.005 mg/L for lead and 0.65 mg/L for copper, you may reduce the number of tap sample sites as shown in Table 1, under Reduced Monitoring, and reduce the frequency at which you sample to once every three years.

If you have completed two consecutive 6-month Standard Monitoring periods and the 90th percentile levels are greater than 0.005 mg/L for lead and 0.65 mg/L for copper, but do not exceed the lead or copper action levels, you may reduce the number of tap sample sites as shown in Table 1, under Reduced Monitoring. You may also reduce the frequency at which you collect the samples to annual monitoring for two more years.

In the second and third years of sampling, collect one set of samples during the month of June, July, August or September. Samples must be analyzed for both lead and copper. After completing the third year of sampling, if there has been no exceedance of the lead or copper action level, collect one set of samples every three years during the month of June, July, August or September. Again, samples must be analyzed for both lead and copper.

If at any time your 90th percentile lead or copper level exceeds the action level, you must contact this office for further guidance.

Section 3. Where to Sample

- Notes:
1. If lead service lines are present in the distribution system, at least half of the samples must come from the sites served by lead service lines.
 2. Do not sample from homes or buildings that have point-of-use treatment (e.g., water softener, carbon filter system, etc.).
 3. Each round of sampling should be conducted at the same sampling sites. If an original sampling site is not available, you should collect a tap sample from another site meeting the same Tier criteria as the original site.

- **Community Water Systems:**

Lead and copper tap samples must be collected from sampling locations that meet the following criteria:

Tier 1 - Single-family structures that contain:

- a) Lead pipes or
- b) Copper pipes with lead solder installed after 1982 or
- c) Pipes served by lead service lines.

If there are not enough Tier 1 sites available, samples must meet the following criteria:

Tier 2 - Buildings and multiple-family residences that contain:

- a) Lead pipes or
- b) Copper pipes with lead solder installed after 1982 or
- c) Pipes served by lead service lines.

If there are not enough Tier 1 and Tier 2 sites available, samples must meet the following criteria:

Tier 3 - Single-family structures that contain copper pipes with lead solder installed before 1983.

If there are not enough Tier 1, Tier 2, and Tier 3 sites available, samples must be collected from representative sites (i.e., plumbing materials commonly found at other sites) throughout the distribution system.

- **Nontransient-Noncommunity Water Systems:**

Lead and copper tap samples must be collected from sampling locations that meet the following criteria:

Tier 1 - Buildings that contain:

- a) Lead pipes or
- b) Copper pipes with lead solder installed after 1982 or
- c) Pipes served by lead service lines.

If there are not enough Tier 1 sites available, samples must meet the following criteria:

Tier 2 - Buildings that contain copper pipes with lead solder installed before 1983.

If additional sites are needed to complete the sampling pool, samples must be collected from representative sites.

Section 4. How to Sample

Depending on the type of water system you operate, the following options are available for sample collection:

- a) You can collect the samples yourself using the procedures outlined below, or
- b) Residents of the water system can collect the samples for you. Letters are usually sent to find volunteers to participate in the sampling program. The attached sample collection instruction sheet must be sent to each participant. Residents collect the samples and complete the bottom portion of the instruction sheet. You collect the filled sample bottles and the completed instruction sheets from the residents. Sample bottles are then transported to the laboratory for analysis.

Sample Procedures:

- 1) Samples from residential housing are to be taken from a kitchen or bathroom cold-water faucet. Do not sample from faucets that have point-of-use treatment (e.g., water softener, carbon filter system, etc.). Samples from a non-residential building are to be collected from an interior tap from which water is typically drawn for consumption.
- 2) Each sample must be collected after the water has stood undisturbed in the pipes for at least 6 hours. It is best to collect the sample first thing in the morning.
- 3) Each sample must be one liter in volume and must contain the first water drawn from the faucet.
- 4) Remove the cap from the one-liter sample bottle, place the container directly below the faucet and gently open the cold-water tap. Fill the sample bottle to the line marked "1-liter or 1,000-ml" and turn off the water.
Tightly cap the sample bottle and complete the required information on the sample bottle label.
- 5) All samples must be analyzed by a laboratory certified by the State to perform drinking water lead and copper analyses.

Section 5. How to Calculate the 90th Percentile Lead and Copper Levels

Complete the attached "Lead and Copper Results Worksheet". If your 90th percentile lead level is greater than 0.015 mg/l, you have exceeded the action level. If your 90th percentile copper level is greater than 1.3 mg/l, you have exceeded the action level.

Section 6. What to Do if You Exceed the Lead or Copper Action Level

If your 90th percentile lead or copper level exceeds the action level, you must contact this office for further guidance.

Section 7. How to Report Your Sample Results

Upon completion of each sampling period, the following items must be submitted to the Visalia District Office, Southern California Drinking Water Field Operations Branch, Department of Public Health:

- 1) A fully completed Form 141-AR (copy attached).
- 2) Laboratory copies of all sample results.
- 3) Completed "Lead and Copper Results Worksheet".

Section 8. Monitoring Waivers

You may apply to the Department for a waiver to reduce the tap sampling frequency for lead and copper to once every **nine** years. If you meet the following materials and monitoring criteria for both lead and copper, a full waiver will be granted. If you meet the materials and monitoring criteria for only one of the chemicals, a partial waiver that covers only that chemical will be granted.

- **Materials Criteria:**

You must provide certification and documentation that the distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, satisfy the following:

For lead, the system must be free of plastic pipes that contain lead plasticizers or plastic service lines that contain lead plasticizers, lead service lines, lead pipes, lead-soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless you can demonstrate that such fittings and fixtures will not leach lead into the drinking water.

For copper, the system must be free of copper pipes and copper service lines.

- **Monitoring Criteria:**

You must have conducted standard tap sampling for at least one six-month period and demonstrate that the 90th percentile levels for all periods of tap sampling conducted since the water system became free of all lead-containing and/or copper-containing materials do not exceed 0.005 mg/L for lead and 0.65 mg/L for copper. You must continue monitoring at the required frequency (Standard Monitoring or Reduced Monitoring) until a waiver is granted.

Lead and Copper Results Worksheet

System Name: _____

Sample Date(s): _____

Determine the 90th percentile lead and copper levels:

1. List all of the samples in Table 1 below in ascending order from the lowest concentration to the highest concentration. Each sample result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest concentration.

2. Determine the 90th percentile lead level by following the instructions given in Table 2.
 Write down the 90th percentile level for lead = _____ mg/L
If the 90th percentile lead level is greater than 0.015 mg/L, you have exceeded the action level.

3. Determine the 90th percentile copper level by following the instructions given in Table 2.
 Write down the 90th percentile level for copper = _____ mg/L
If the 90th percentile copper level is greater than 1.3 mg/L, you have exceeded the action level.

Table 1 - Sample Results

	Sample Address	Lead Level (mg/L)	Copper Level (mg/L)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Table 2 - Determining the 90th Percentile Lead or Copper Level

Number of Tap Samples Collected	How to Determine the 90 th Percentile Lead or Copper Level
1 to 5	Average the two highest sample results to get the 90 th percentile level.
6 or more	Multiply the number of samples collected by 0.90. This is the 90 th percentile placeholder. The sample result for the placeholder is the 90 th percentile level.

LEAD AND COPPER RULE SAMPLING REPORT

System's Name: _____

Type: CWS NTNCWS

Address: _____

Size: >100,000
 50,001 to 100,000
 10,001 to 50,000
 3,301 to 10,000
 501 to 3,300
 101 to 500
 ≤ 100

Telephone Number: _____

System ID Number: _____

Contact Person: _____

Sample Date(s): _____

SAMPLE SITE IDENTIFICATION

Number of sample sites in each category:

- Single-family structures with copper pipes with lead solder installed after 1982 or lead pipes or lead service lines _____
 - Multi-family structures with copper pipes with lead solder installed after 1982 or lead pipes or lead service lines _____
 - Buildings containing copper pipes with lead solder installed after 1982 or lead pipes or lead service lines _____
 - Single family structures with copper pipes with lead solder installed before 1983 _____
- Total: _____

Number of lead service lines present in the distribution system: _____

Number of samples collected from sites served by lead service lines: _____

The following sources have been explored to determine the number of structures that have interior lead pipe or copper pipe with lead solder:

- | | |
|---|--|
| <input type="checkbox"/> Plumbing and/or building codes
<input type="checkbox"/> Plumbing and/or building permits
<input type="checkbox"/> Contacts with the building department, municipal clerk's office, or state regulatory agencies
<input type="checkbox"/> Water quality data | <input type="checkbox"/> Interviews with building inspectors
<input type="checkbox"/> Survey of service area plumbers about when and where lead solder was used from 1982 to present
<input type="checkbox"/> Survey of residents
<input type="checkbox"/> Interviews with local contractors & developers |
|---|--|

The following sources have been explored to determine the number of lead service lines in the distribution system:

- Distribution system maps and record drawings
- Capital improvement plans and/or master plans for distribution system development
- Standard operating procedures and/or operation & maintenance manuals for the types of materials used for service connections
- Utility records including meter installations, customer complaint investigations
- Water quality data
- Interviews with senior personnel
- Conduct service line sampling where lead service lines are suspected to exist
- Review of permit files
- Survey of residents
- Interviews with local pipe supplies, contractors and/or developers

